UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 8, MONTANA OFFICE
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HELENA, MONTANA 59626

Ref: 8MO

April 14, 2008

"M" Pit Mine Expansion at Montana Tunnels Mine EIS
Att: Greg Hallsten, Directors Office
Montana Dept. of Environmental Quality
P.O. Box 200901
Helena, MT 59620-0901

Re: CEQ # 20080048, EPA Comments on DEIS for the "M" Pit Mine Expansion at Montana Tunnels Mine

Dear Mr. Hallsten:

The Environmental Protection Agency (EPA) Region VIII Montana Office has reviewed the Draft Environmental Impact Statement (DEIS) for the for the "M" Pit Mine Expansion at the Montana Tunnels Mine in Jefferson County, Montana in accordance with EPA responsibilities under the National Environmental Policy Act (NEPA), 42 U.S.C. 4231 and Section 309 of the Clean Air Act. Section 309 of the Clean Air Act directs EPA to review and comment in writing on the environmental impacts of any major Federal agency action. EPA's comments include a rating of both the environmental impact of the proposed action and the adequacy of the NEPA document.

There are aspects of the proposed Montana Tunnels Mine expansion which indicate that there could be long-term problems associated with elevated levels of toxic metals in mine site seepage and runoff, and contaminated mine site groundwaters may be transported to downstream surface waters, including water quality impaired waters listed under Section 303(d) of the Clean Water Act (e.g., Spring Creek). The DEIS states that acid-base accounting using static testing has shown that 68 percent of samples tested to date for the existing mine have Neutralization Potential/Acidification Potential (NP:AP) ratios less than 3, indicating that the waste rock and tailings have either an uncertain or acid-generating potential.

EPA is worried that metals may be mobilized at even near neutral pH levels, as well as more typical acid rock drainage (i.e., metals levels that exceed surface or groundwater water quality standards are the primary concern). Metals mobility kinetic testing shows potential for mobilization of some metals (e.g., arsenic, cadmium, copper, cyanide, lead, manganese, and zinc) for some waste rock types, ores and tailings. Testing of all 58 tailings samples appeared to evidence a NP:AP ratio of less than one, predicting acid generation, and the DEIS states that it is unclear whether current neutral conditions in tailings would continue as tailings dewater at mine closure due to exposure of tailings to higher concentrations of oxygen. The DEIS also states that the acid generating potential of waste rock and tailings will significantly increase as the pit deepens; and that it is unclear if the shift toward lower NP:AP values with increasing depth would result in acid generation, because there are no supporting kinetic test data which correspond solely to the deeper mineralization.

Further, the DEIS shows elevated levels of cadmium in groundwater well GW-5, and cadmium and zinc in well GW-10, although average concentrations of metals in monitoring wells located downgradient of the Montana Tunnels tailings storage facility and south pond were stated to be generally below DEQ-7 groundwater standards. However, we note that DEQ-7 surface water quality standards are much more stringent than groundwater standards for some metals. Water with elevated metals levels that may still meet groundwater standards has potential to exceed acute and chronic aquatic life surface water criteria, and thus, exhibit toxicity to aquatic life if groundwater with elevated metals levels were to enter surface waters. We believe it is important to address the potential for contaminated groundwaters to enter surface waters.

Clancy Creek and Spring Creek and its downstream tributary Prickly Pear Creek are listed by the State of Montana under Clean Water Act Section 303(d) as water quality impaired waters. Elevated levels of metals including arsenic, copper, cadmium, lead, and mercury are among the sources of water quality impairment to these waters. The Montana Tunnels Mine expansion project, mine closure, and post-closure activities need to be consistent with Total Maximum Daily Loads and Water Quality Plans being prepared for restoration of water quality and full support of beneficial uses in the impaired streams. We have particular concerns that contaminated mine site groundwaters may be transported to Spring Creek, which would not be consistent with the restoration of water quality and beneficial uses in Spring Creek.

We believe the agencies and Montana Tunnels Inc. should take a conservative, pro-active perspective and anticipate metals mobilization from tailings and waste rock piles over the long-term. Mitigation measures and contingency actions should be planned and designed with the expectation that runoff and/or leachate from waste rock piles and the tailings impoundment has potential for contamination with elevated metals levels over the long-term (i.e., decades). Also, a water balance for the Agencies Modified Alternative (Alternative 3), including groundwater flows, should be provided to allow improved evaluation of water quality impacts.

We recommend that the preferred alternative include tailings impoundment mitigation measures to reduce the potential for development of tailings seepage or leachate containing elevated metals levels. These include measures noted in the DEIS such as addition of lime to the tailings during final operations to enhance the neutralization potential of the final lift of tailings; placement of a thicker, denser impoundment cap that would both reduce oxygen flux to slow down oxidation of the tailings, and reduce hydraulic conductivity and water movement down through the tailings, and thus, reduce seepage of water through the tailings and volume of tailings leachate.

We are pleased that geochemical testing to identify the presence of potentially acid-generating waste rock is being conducted, and that Alternative 3 includes a more detailed waste rock monitoring program and operational verification program for handling waste rock with potential to generate acid. We support adequately encapsulating potentially acid-generating waste rock with neutralizing rock, and using impermeable waste rock caps and pile designs that minimize water movement down through waste rock piles. As noted above, geochemical testing to date shows that over two-thirds of rock may have uncertain or acid-generating potential, and acid-generating potential will increase as the pit deepens. EPA, therefore, has concerns that there may not be a sufficient amount of neutralizing waste rock to buffer all the acid generated, and prevent release of toxic contaminants to surface and groundwater over the long-term. We recommended that BLM and MDEQ specify in greater detail in the FEIS, the requirements and sources for the neutralizing material necessary in the waste rock pile to assure that adequate neutralizing waste rock is available.

We also believe the water sampling and testing program to assess water quality of waste rock pile and tailings runoff and leachate, other mine site runoff/drainage, the pit lake, and down-gradient stream water quality will likely need to be conducted well beyond 5 year closure period due to the long-term nature of acid rock drainage and the chemical reactions that mobilize metals (i.e., years or even decades). The FEIS should further discuss the long-term monitoring program for evaluation of surface and groundwater quality at the Montana Tunnels Mine site, including monitoring of all mine site runoff/drainage, surface and ground waters, including waters downgradient from the mine site.

We are also concerned about the potential for elevated metals and other contaminants to occur in the pit lake following mine closure. The DEIS states that pit water quality would meet DEQ-7 surface water quality standards, with the exception of manganese. This prediction appears to be a change from the earlier 1986 predictions at the time of the original EIS which anticipated several thousand micrograms per liter iron, manganese, and zinc, and several hundred micrograms per liter aluminum, cadmium, copper, and lead in the pit lake. We believe the pit lake water quality predictions and modeling should be reviewed and discussed further in the FEIS, particularly the change from the earlier 1986 predictions. Since the DEIS states that the pit lake may seep to groundwater in the Spring Creek drainage, potential degradation of pit lake water quality could have adverse effects on Spring Creek water quality (a 303(d) listed stream). Also, projected post-mining uses of the pit lake should be more clearly presented.

The DEIS suggests that there may be a potential need to treat mine site runoff and/or seepage following mine closure, but few details are provided regarding potential treatment systems being considered for treatment of mine site contaminated waters. Other contingencies to address potential environmental contamination following mine closure are not discussed in great detail. The DEIS states that contingencies to address "undesirable results from monitoring" would be addressed in bonding, but are not considered part of Alternative 3. Given the history of adverse environmental effects resulting from some hard rock mines in the past, and the expenditure of public funds used in some cases to address environmental problems caused by mining (such as CERCLA, CECRA, or the State abandoned mine reclamation funding), adequate bonding is critical to ensure that funds will be available to properly close the mine and avoid potential for future taxpayer liability.

The DEIS states that the MDEQ and BLM jointly hold reclamation bonds in the amount of $18,125,177, and that this amount was updated in 2005. Bonding levels must be adequate to assure that the full cost of all potential and feasible controls will be obtained to maintain compliance with surface and ground water quality standards; including possible long-term monitoring, treatment, maintenance, infrastructure costs, replacement, and contingencies. EPA strongly recommends that bonding requirements be appropriate for the amount of uncertainty regarding the predictions for the length of time predicted for the pit to fill, the future water quality in ground water and the pit and the uncertainties associated with the future tailing impoundment chemistry.

We are concerned that the current level of bonding may not be adequate to assure that environmental degradation that may occur during or after mine closure will be appropriately remedied. We believe the adequacy of the financial assurances should be further discussed in the FEIS. The Final EIS and ROD should commit to including sufficient coverage for addressing handling all potential closure/post-closure environmental contamination that may occur, for as long as it may be necessary. This financial assurance should be included in an updated bond estimate and, if necessary, long-term mine closure operation and maintenance plan and fund.

EPA's more detailed comments, questions, and recommendations regarding the analysis, documentation, and/or potential environmental impacts of the "M" Pit Mine Expansion at Montana Tunnels Mine Draft EIS are enclosed for your review and consideration as you complete the Final EIS. Based on the procedures EPA uses to evaluate the adequacy of the information and the potential environmental impacts of the proposed action and alternatives in an EIS, **the DEIS has been rated as Category EO-2, Environmental Objections-Insufficient Information).** EPA's DEIS rating criteria are attached.

Our objections are due to potential significant adverse effects to water quality, and insufficient information has been provided in the DEIS to ensure that metals contamination of surface and groundwaters will be adequately mitigated, and that pollutant loads are consistent with TMDLs for impaired waters. Additional information is necessary in the Final Environmental Impact Statement (FEIS) regarding mine site water management, TMDL consistency, mitigation, closure, and bonding.

The EPA appreciates the opportunity to review and comment on the DEIS. If we may provide further explanation of our comments please contact Mr. Steve Potts of my staff in Missoula at 406-329-3313 or in Helena at (406) 457-5022, or via e-mail at potts.stephen@epa.gov . Thank you very much for your consideration.

Sincerely,

/s/ John F. Wardell
Director
Montana Office

Enclosures
cc: Larry Svoboda/Julia Johnson, EPA 8EPR-N, Denver
Robert Ray/George Mathieus, MDEQ, Helena
David Williams/Joan Gabelman, BLM, Butte

EPA Detailed Comments on the "M" Pit Mine Expansion at Montana Tunnels Mine DEIS

A. Project Overview:

The Montana Department of Environmental Quality (DEQ), and the Bureau of Land Management (BLM) prepared this DEIS to analyze impacts of a proposed expansion of the Montana Tunnels Mine near Jefferson City, Montana (an open pit gold, silver, lead, and zinc mine operated by Montana Tunnels Mining Inc.). Montana Tunnels Mining Inc. proposes to expand the currently permitted L-Pit to deepen the pit to continue mining (M-Pit). The proposed action would increase the acreage of the pit by 39.3 acres to 287.7 acres; deepen the pit by 200 feet; raise the tailings impoundment embankment and increase area by 13.3 acres; realign a portion of the mine access road; expand the waste rock storage area by 153 acres; divert the course of two stream channels; and create new soil stockpiles.

Three alternatives have been evaluated: **Alternative 1** - No Action Alternative (L-Pit), which is Montana Tunnels'present Operating Permit 00113 for the L-Pit Plan; **Alternative 2** - Proposed Action Alternative (M-Pit), which is the Montana Tunnels Proposed Action for the M-Pit Mine Expansion; and **Alternative 3** - Agency Modified Alternative, which includes many additional mitigation measures. The proposed mine expansion (Alternative 2) would impact 1,800 feet of the Clancy Creek channel, eliminating this section of the Creek, however, the Agency Modified Alternative (Alternative 3) would create a new channel for Clancy Creek. This activity would require a Section 404 permit from the U.S. Army Corps of Engineers.

Comments:

B. Geochemistry

1. The DEIS states that acid-base account static and kinetic testing is done on waste rock, and that the majority of geochemical testing samples to date (i.e., 68 percent) have Neutralization Potential/Acidification Potential (NP:AP) ratios less than 3 with uncertain or acid- generating potential (page 3-41). Figure 3.5-3 (page 3-47) appears to evidence that all 58 tailings samples tested had NP:AP ratios less than one predicting acid generation. The DEIS acknowledges, therefore, that the tailings have the potential to generate acid, although it is also stated that static testing has consistently over predicted acid generation potential for Montana Tunnels materials, and tailings do not generate acid during kinetic testing (page 3-44). The DEIS states that the unique mineralogy of the site creates a balance between the rate of sulfide oxidation (acid production) and neutralization (page 3-60); and that acid-base account data do not provide reliable criteria for separating waste rock, since samples that show acid producing potential in static tests do not produce acid during kinetic tests (page 3-69). The DEIS summarizes reasons for reduced concern about acid generation at Montana Tunnels Mine (pages 3-41, 3-43):

Montana Tunnels Mine ABA testing procedures conservatively understate concentration of neutralizing materials.

AP calculation use total sulfur concentrations, that overestimates potential acidity with Pb and Zn sulfides, since they do not normally produce acid.

Rock and tailings do not contain sub-micron sized grains of pyrite that are easily weathered, making acid generation reactions very slow.

Alumino-silicate minerals in mine rock contribute a slow but steady supply of NP and carbonate and Alumino-silicate minerals that exceeds the amount needed to balance acid potential.

We have some concern that these statements appear to downplay potential mobilization of metals in mine site surface and ground waters over the long-term. Those who have evaluated the long term, significant environmental impacts from the oxidation of sulfidic mining wastes, frequently have found that acidic heavy metal-bearing effluents from mining waste piles are often not reliably predicted using test procedures that evaluate acid rock drainage (ARD). ARD drainage can occur over periods of years and sometimes decades. The DEIS states that Dollhopf concluded that coarse-grained pyrite present in tailings samples could eventually weather to yield acidity despite the lack of rapidly weathering submicron-sized pyrite (page 3-44). The DEIS also states that it is unclear whether current neutral conditions in tailings would continue as tailings dewater at mine closure due to exposure of tailings to higher concentrations of oxygen (page 3-46).

It appears to us that there is potential for mobilization and transport of metals in leachate and runoff at the Montana Tunnels Mine site. The elevated levels of sulfates in area groundwater provide evidence that oxidation of sulfidic rocks is occurring in the mining area. Elevated metals levels in area waters have been measured (page 3-87). As the pit deepens the potential for acid generation in the tailings and waste rock increases (page 4-11). The Appendix B Geochemical Testing Report says that rock mined below 5,100 feet in elevation has a significantly greater potential to generate acid (page B-3). This mine expansion proposal will deepen the pit by 200 feet to the 4,050 foot elevation (page 2-34), and thus, mine rock with significantly greater potential to generate acid (and mobilize metals).

Figure 3.5-2 (page 3-45) shows median NP/AP levels below 1 for pit rocks in the deeper portions of the pit (acid generating). Table 3.5-2 (page 3-44) shows a median NP/AP ratio of 0.72 for pit rock samples collected between 4,100 and 4600 feet elevation. The DEIS states (page 3-43) that it is unclear if the shift toward lower NP:AP values with increasing depth would result in acid generation, because there are no supporting kinetic test data which correspond solely to the deeper mineralization.

It is also not clear to us why relatively few rock samples appear to have been tested for acid generation potential between 4,100 and 4600 feet elevation in comparison to higher elevations in the pit (i.e., 6 samples tested between 4,100 and 4600 feet elevation; 195 samples tested between 4,600 and 5,100 feet elevation; 901 samples tested between 5,100 and 5,600 feet, Table 3.5-2). The relative scarcity of samples collected in the deep portions of the pit that would be mined during this proposed expansion may skew statistical evaluation of acid generation potential.

We recommend that additional testing data for the deep portions of the pit to be mined during this expansion be provided in the FEIS. In particular, rock from deeper portions of the mine should be sampled and tested more extensively. The FEIS should also explain why so few rock samples were tested for acid generation potential in the deeper portions of the pit.

The FEIS should also disclose more clearly the amount of waste rock and tailings produced during this mine expansion that would come from the deeper portions of the pit below elevation 5,100 that are stated to have "significantly greater potential to generate acid."

2. We appreciate the presentation of the waste rock metal mobility kinetic test data summary in Table 3.5-3 (page 3-48 to 3-51); ore metal mobility kinetic test data in Table 3.5-4 (page 3-52); tailings metal mobility kinetic test data in Table 3.5-5 (page 3-55 -57), as well as Table 2.2-2 (page 2-14), and other tables in DEIS Sections 3.6 and 3.7 showing tailings and waste rock seepage water quality data (e.g., Tables 3.6-10, page 3-103). However the analyses for the most part are for dissolved metal concentrations, whereas the Montana water quality standards are based on total recoverable digestion procedures (page 3-51).

   The metals mobility testing data in the DEIS show potential exceedances of surface water quality criteria for copper, lead, arsenic and manganese in the testing on some waste rock types; exceedances of surface water quality criteria for cadmium lead, manganese and zinc in some ore testing; and exceedances of surface water quality criteria for cadmium, copper, iron, lead, manganese, zinc and cyanide in the testing on tailings. The DEIS states that mean concentrations of manganese exceeded the SMCL in extracts from most waste rock samples, and arsenic was above the DEQ-7 surface water quality standard for human health of 0.010 mg/l in all extracts from the biotite-bearing quartz latite dike sample (page 3-46).

   The environmental analysis in the DEIS appears to focus primarily on groundwater standards. However, for most pollutants of concern for this project, the aquatic life standards are much more stringent. Aquatic life criteria for metals in Montana Water Quality Standards are generally expressed in micrograms per liter (ug/l), and toxicity calculated taking into account hardness (as CaCO3). The groundwater standard for copper is 1,300 ug/l, but the acute and chronic aquatic life criteria for copper are 7.3 ug/l and 5.2 ug/l at a hardness of 50 mg/l. Similarly, the groundwater standard for zinc is 2,100 ug/l, but the acute and chronic aquatic life criteria for zinc are 67.0 ug/l at a hardness of 50 mg/l. The groundwater standard for cadmium is 5 ug/l, and the acute and chronic aquatic life criteria for cadmium are 2.067 ug/l and 1.429 ug/l respectively, at a hardness of 50 mg/l.

In the DEIS a hardness of 240 mg/l was used without clear reference or justification. The DEIS should clearly disclose the origin of this hardness value, including when and where the samples were taken? If a hardness of 240 mg/l is the appropriate hardness value to use for mine site waters, we recommend that acute and chronic aquatic life criteria for metals at that hardness level be included in the metals mobility tables (Tables 3.5-3, 3.5-4, 3.5-5) to make it more evident to readers that there are exceedances of surface water quality standards for protection aquatic life in the metals mobility testing, and in some groundwater samples.

Also as there as been a public drinking water supply in Corbin, the FEIS should identify if the water source for this public water supply is impacted by the Montana Tunnels Mine.

3. Tailings acid generation and metals mobility - We are particularly concerned with the potential metals loading from the tailings pile. Figure 3.5-3 shows NP/AP levels below 1 for tailings (acid generating). Mean water quality data from 1993 through 1999 (page B-11 and Table D3) indicate that cadmium, copper, lead manganese and cyanide exceeded the lowest applicable standards. For samples collected from 2001 through 2004 have lower concentrations compared to earlier sampling, although manganese and cyanide continue to exceed standards. Data provided on samples of the South pond water, tailings drain water and underdrain water (Table 3.5-5) also confirm exceedences of the lowest applicable standards for arsenic, cadmium, copper, lead, manganese and cyanide.

   The rates of acid generation and neutralization may be not be synchronized. Indications in the graphs of the long term column leach test data (C1 – C5) are that the cumulative alkalinity (neutralizing potential) will peak early and plateau, whereas the sulfate (an indicator of acid generation) continues to climb. What are the long term projections of these column tests? What would happen if oxidizing conditions were established? On page 3-46 references are made to ASTM kinetic testing that was not yet completed. As this data is now available it should be included in the FEIS with modified interpretations and conclusions as appropriate.

4. Appendix B indicates that a 14 year column leach test was done on two samples of waste rock collected from the open pit and waste dump pile (page B-5). While it is stated that effluent from waste rock test columns maintained neutral to slightly basic pH levels during the 14 year test period, we could find no discussion of testing of metals levels in the waste rock column effluent. It would be of great interest to know if elevated levels of metals were present in any samples. It is important to understand that EPA's concern is that metals may be mobilized at even near neutral pH levels, as well as more typical acid rock drainage (i.e., metals levels that exceed surface or groundwater water quality standards are the primary concern).

5. We recommend that the FEIS evaluate the rock testing and water quality data to determine if there are other metals of concern for the water quality. Metals of concern are typically compounds that are present at levels near or greater than water quality criteria. Usually, the range of values for water quality data is used for assessing pollutants of concern instead of an average.

   We note that metals mobility data was not presented for other potential contaminants such as antimony, barium, boron, chromium, mercury, selenium, or silver. The DEIS states that DEQ eliminated boron, chromium, mercury, molybdenum, selenium, and silver from its groundwater monitoring list because groundwater data indicated that these constituents were at or below laboratory detection limits (page 3-82).

   Has any testing ever been done for these other potential contaminants during metal mobility kinetic tests on Montana Tunnels Mine ores, waste rocks or tailings? Is it believed that the current and proposed metals testing and water quality analyses are comprehensive enough to identify all potential contaminants in mine site surface and groundwaters?

   In Alternative 3 it is stated that tailings leachate water quality would be monitored for cadmium, cyanide and manganese (page 3-69). We recommend that copper, lead, and zinc be added to the list of parameters to be analyzed in tailings leachate, since Table 3.5-5 shows some surface water quality standard exceedances for these parameters.

   We recommend that the more comprehensive laboratory analytical parameter list shown in Table 3.6-3 (page 3-83) be used in long-term water quality testing, until it can be demonstrated that parameters should be removed from the list due to repeated non-detection.

6. We believe it is important that a cautious or conservative perspective be used regarding metals mobilization potential from sulfidic mineralized wastes. We are pleased that geochemical testing to identify the presence of potentially acid-generating waste rock is being conducted (page 2-15, 2-38), and that Alternative 3 includes a more detailed waste rock monitoring program (Appendix D) and operational verification program for handling waste rock with potential to generate acid (page 2-51). The DEIS states (page 2-15) that waste rock that contains potentially acid generating material would be covered with non-acid-generating cap rock and then covered with 16 inches of soil, and in Alternative 3 waste rock piles would be constructed in 50 foot lifts (page 2-54).

   Accurate characterization of all waste rock is important in determining the amount and timing of available neutralizing waste rock to sufficiently encapsulate and buffer potentially acid-generating rock. The waste rock handling plan should specify how the distinctions within and between the different rock types will be made during operations and how each rock type will be disposed accordingly. It is important that representative samples of each rock type (not just by elevation) be adequately sampled and tested with static and kinetic testing with metals analyses, and that volume estimates for each rock type that would be placed in the waste rock piles and volumetric calculations of NP:AP be carried out on all waste rock.

Potentially acid-generating waste rock should be strategically placed so it is admixed with and surrounded by sufficiently neutralizing waste rock or other material (e.g., limestone) to preclude the generation of acidic and/or metal contaminated drainage/leachate. The appropriate volume and neutralizing capacity of admixed and encapsulating rock needs to be calculated for each block of potentially acid-generating rock based on stoichiometry of the material. It is also important that waste rock soil caps have minimal permeability to reduce water movement through waste rock piles to reduce volume of waste rock leachate. Has a hydraulic conductivity design specification been required for the waste rock caps?

We recommended that BLM and MDEQ specify in greater detail in the FEIS, the requirements and sources for the neutralizing material necessary in the waste rock dumps, and assure that adequate neutralizing waste rock is available. Given that geochemical testing to date shows 68 percent of rock may have uncertain or acid-generating potential, and acid-generating potential increases with pit depth, and there is no kinetic testing data for the deeper mineralization to be mined during this expansion, EPA is concerned that there may not be a sufficient amount of neutralizing waste rock to buffer all the acid generated, and prevent release of toxic contaminants to surface and groundwater over the long-term.

7. We support the proposal to refuse Elkhorn Goldfields ore should geochemical testing determine that it could produce tailings with elevated metals levels, or to construct a separate tailings facility that would segregate these tailings from the existing tailings facility (page 5-6). We also note that a separate tailings facility would have to include appropriate mitigation measures to avoid groundwater and surface water contamination. As the geochemistry of the ore and tailings from the Elkhorn Goldfields, Inc./Golden Dream project have not been evaluated, a new environmental assessment or EIS would be necessary before this proposal could move forward.

C. Water Balance, Ground & Surface Water Flow

8. A water balance for the no action alternative and Alternative 2 is provided in Figure 2.2-3 (page 2-8), but a water balance does not appear to be provided for Alternative 3. The water balance presented in Figure 2.2-3 is inadequate to project the potential flows and loads for the preferred alternative in the DEIS during the various phases of operation and closure, specifically during a probable worst case scenario. It is important that a site specific water balance and chemical loading model be presented for both mine operations and mine closure in order to evaluate water quality impacts of the preferred alternative. Identification of surface and groundwater flows and pollutant loads from each source: the pit, waste rock, tailings pile (input and output during operation and at closure), the sedimentation pond and the south pond and

upgradient inputs (flows and loads) from other sources should be presented (i.e., pumping and flow during operation, makeup water, diversion ditches, stormwater, side slope dewatering, groundwater pumpback systems, etc.). To the extent possible groundwater potentimetric surfaces, flow from faults and fractures, alluvium infiltration, infiltration from the sump pond, the sedimentation pond and the tailings pond should be quantified from a hydrologic and chemical standpoint.

Seasonal and climatic variability may also be important to capture (e.g., hydrographs for Clancy Creek, Pen Yan and Spring Creek would be of interest). How much water is coming from precipitation from each of the source areas? What is the design flow for reconstructed Clancy Creek, page 2-54 states a 1 in 20 year return period 24 hour storm event? Most projections of precipitation are for 10yr/24 hr events or 25yr/24 hr events (See Western U.S. Precipitation Frequency Maps NOAA Atlas 2 published in 1973. (HDSC/NWS Office of Hydrology) or (wrcc@dri.edu). What is the design flow for the reconstructed Pen Yan Creek? For operations drainage ditches are said to be designed for the 100 year event (page 2-9); what are the flows?

Separate water balances for critical times in the mine operation and closure are necessary. A mass loading model is referenced on page 3-64 yet none of this information was presented in the DEIS nor were the alternatives compared.

D. Water Quality

9. As noted earlier, for most pollutants of concern for this project, the aquatic life surface water quality standards are much more stringent than groundwater standards. Also metals analyses are for dissolved metal concentrations, whereas the Montana water quality standards are based on total recoverable digestion procedures (page 3-51) Arsenic is also a pollutant of concern in this watershed and mobilizes at more neutral pHs, such as the pH levels currently found in the existing mine.

   The DEIS states that recent analysis of combined tailings drain water do not show metal concentrations above DEQ-7 standards for human health (page 2-13), however, data in Table 3.5-5 (page 3-56) show tailings drain water exceeded surface water quality standards for cadmium, copper, iron, lead, manganese, zinc and cyanide. Data in Table 3.5-3 also show exceedances of surface water quality standards for some metals as well. Please note that there is an apparent conflict between the data in these tables and the statement on page 3-46 that there were no exceedances of applicable DEQ-7 water quality standards. The data in Table 3.5-4 also show exceedances of surface water quality standards for zinc, contrary to statements on page 3-54. Table 3.6-4 (page 3-85) shows elevated levels of cadmium, manganese and zinc in groundwater downgradient from the tailings and south pond.

   Ground water with elevated metals levels that may still meet ground water standards which surfaces downstream from the site has potential to exceed acute and chronic aquatic life surface water criteria if groundwater with elevated metals levels were to enter surface waters. Waters meeting groundwater standards for copper or zinc could exhibit toxicity to aquatic life if such contaminated groundwater flowed into surface waters.

The DEIS states that tailings drain waters exhibit low levels of total cyanide below the DEQ-7 groundwater standard of 0.2 mg/l (page 3-95). The acute and chronic aquatic life criteria, however, for cyanide (22 ug/l and 5.2 ug/l, respectively) are much lower than the 200 ug/l groundwater standard. There could also be concerns, therefore, regarding potential aquatic life toxicity associated with elevated cyanide levels should cyanide contaminated groundwaters enter surface waters. The combined effects of several toxic constituents in ground or surface waters (i.e., metals and cyanide) may also be a cause of concern.

We have particular concerns that contaminated groundwaters from the mine site may be transported to Spring Creek, which would not be consistent with the restoration of water quality and beneficial uses in Spring Creek. Contingency actions that will be taken in the event of metals contamination of mine site groundwaters and surface waters should be more clearly and fully described.

10. Clancy Creek and Spring Creek and their downstream tributary Prickly Pear Creek are water quality impaired waters listed under Section 303(d) of the Clean Water Act by the Montana DEQ. Elevated levels of metals including arsenic, copper, cadmium, lead, and mercury are among the sources of water quality impairment. Information on Montana's 303(d) listed water bodies can be found on-line at http://www.deq.state.mt.us/CWAIC/default.aspx .

    Stream segments designated as "water quality impaired" and/or "threatened" listed on State 303(d) lists require development of a Total Maximum Daily Load (TMDL). We are concerned that additional mining disturbance and mining of materials with higher potentials to generate acid mine drainage at the Montana Tunnels Mine may further impair water quality and impede efforts to restore water quality in the Prickly Pear Creek / Lake Helena Watersheds.

    It is EPA's policy that proposed activities in the drainages of 303(d) listed streams should not cause further degradation of water quality, and should be consistent with TMDLs and Water Quality Plans intended to improve water quality and restore full support of beneficial uses to the impaired waters. Such consistency means that if pollutants may be generated during project activities, mitigation or restoration activities should also be included to reduce existing sources of pollution to offset or compensate for pollutants generated during project activities in accordance with the TMDL and long-term restoration plan. Recognizing uncertainties and desiring a margin of safety, such compensation should more than offset pollutants generated, resulting in overall reductions in pollution consistent with long-term water quality improvement and restoration of support of beneficial uses. Watershed restoration activities that compensate for pollutant production during management activities in watersheds of 303(d) listed streams should also be implemented within a reasonable period of time in relation to pollutant producing activities (e.g., 5 years).

It is important that the proposed Montana Tunnels Mine M Pit Expansion project and post-mining reclamation and closure be consistent with TMDLs and Water Quality Plans developed for impaired waters in the project area. TMDLs have been established for Clancy Creek, Spring Creek and Prickly Pear Creek in the Lake Helena TMDL August 31, 2006 (see at, http://www.deq.state.mt.us/wqinfo/TMDL/finalReports.asp). The following table outlines the water quality improvement goals for metals in the three creeks surrounding the Montana Tunnels Mine.

TMDL Watershed metals loads and required reductions [1]

Segment	Metal	Existing Load (lbs/yr)	Load Reduction (%)	Total Allowable Load (lbs/yr)
Clancy Creek (MT41I006_120)	Arsenic	717.9	61.1%	279.3
	Cadmium	34.0	61.2%	13.2
	Copper	897.0	42.3%	517.6
	Lead	339.0	54.1%	155.6
	Zinc	20,038.9	47.0%	10,620.6
Prickly Pear Creek (MT41I006_020) (MT41I006_030) (MT41I006_040) (MT41I006_050) (MT41I006_060)	Arsenic	9,497.9	58.5%	3,942.6
	Cadmium	652.1	73.8%	171.2
	Copper	14,200.1	58.0%	5,968.3
	Lead	6,627.9	68.6%	2,081.8
	Zinc	293,913.6	59.6%	118,623.5
Spring Creek (MT41I006_080)	Arsenic	671.2	56.1%	294.6
	Cadmium	123.6	87.1%	15.9
	Copper	1,860.7	64.1%	668.0
	Lead	1,195.0	81.6%	219.8
	Zinc	74,792.8	80.7%	14,401.0

Clancy Creek impaired by sediment/siltation from primarily from natural sources and stream bank erosion. The main elements of the siltation TMDL are to reduce anthropogenic stream bank erosion by 81%, and siltation from unpaved roads by 60%.

The TMDL for Spring Creek has proposed the following load reduction goals from historic mining sources. The main source of metals loads identified on Spring Creek are historic mining. This would include some metals loading sources from the Montana Tunnels such as metal laden ground water which is not pumped back into the process and speepage from roads/embankment from constructed from historic waste rock. The TMDL also establishes the goal of reducing the permitted arsenic load from the Montana Tunnels Mine by 60%.

[1] Excepts from Table 3-10 on page 36 of the *Framework Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume II – Final Report,* August 31, 2006

TMDL, Wasteload Allocation for Historic Mining for Spring Creek[2]		
Metal	% Reduction	Allocation (lbs/year)
Arsenic	62%	131.2
Cadmium	94%	7.2
Copper	73%	397.9
Lead	90%	111.2
Zinc	94%	4,051.3

Spring Creek is also impaired by nitrogen and phosphorus. There was not sufficient detail in the TMDL document to identify if Montana Tunnels Mine could be a source of nutrients contributing to stream impairment. Frequently, at seepage from mines waste rock piles or tailing ponds contribute to high nitrogen loadings from the blasting residue and cyanide destruction processes. Is there any information on the loading of nitrogen that could be coming from the waste rock and tailings at the Montana Tunnels Mine? The information should be analyzed considering the current situation of pumping ground water back into the mine and post-mining.

The TMDL identifies dirt roads and septic systems as the two main anthropogenic sources of nitrogen in the Spring Creek watershed. Similarly to dirt roads and timber harvests are identified as the main anthropogenic sources of phosphorus. The TMDL targets for reducing nitrogen and phosphorus loadings in Spring Creek are 75% and 83%, respectively. The monitoring data for the site should be examined to determine if the seepage from the waste rock, tailings ponds, pit, etc. are a noticeable contributor to nitrogen loadings in Spring Creek. If the mine area is a significant source of nitrogen loading, then mitigation measures should be developed in the FEIS to achieve the target of reducing nitrogen by 75%.

Spring Creek impaired by sediment/siltation from primarily from natural sources, unpaved roads and stream bank erosion. The main elements of the siltation TMDL are to reduce loads from unpaved road by a 60% timber harvests by 97% and abandoned mines by 79%. The FEIS should examine opportunities to reduce sediment loadings from areas associated with the mine or nearby such as roads, historic placer mining areas, and historic waste rock piles.

The FEIS should better demonstrate that the mine will meet applicable groundwater and surface water quality standards, and be consistent with the TMDL and Water Quality Plan for restoration of the Prickly Pear Creek/Lake Helena watershed, both during operation and after mine closure. We encourage the BLM and MDEQ mining review staff to fully coordinate with MDEQ's TMDL Program staff to assure that the MDEQ TMDL staff consider the proposed project to be consistent with applicable TMDLs and Water Quality Plans (contact Robert Ray of the MDEQ in Helena at 444-5319).

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[2] From Appendix A, Total Maximum Daily Load (TMDL) Summary to *Framework Water Quality Restoration Plan and Total Maximum Daily Loads (TMDLs) for the Lake Helena Watershed Planning Area: Volume II – Final Report,* August 31, 2006

We recommend that the FEIS developed an approach to implement the TMDL for the Montana Tunnels Mine watershed. Typically, the best approach to reducing metals loadings in historic mining districts is to develop a collaborative plan to identify the most efficient way to remove metals from the watershed. For example, if there are historic waste rock piles generating acid rock drainage or placer mining disturbances, it may be more environmentally and cost effective to clean up the historic problem. Alternatively, Montana Tunnels may want to focus solely on its own mine area to establish metal loadings from ground water, sediment and runoff in addition to those loadings allowed under the mines and NPDES permit.

E. Ground water

11. What data / information was used to support the conclusion that ground water in the bedrock flows north in the area north of the pit and southeast in the area to the south of the pit? This conclusion needs to be supported (page 3-76). Is there any potential for hydraulic connections between waters in the permitted area and abandoned mines?

12. There is no information or data to describe the hydraulic relationship between the ground water in the valley fill deposits of Spring Creek, Pen Yan Creek, Clancy Creek, ground water in the underlying bedrock and surface water in the channels of Spring Creek, Pen Yan Creek, Clancy Creek. It is very important to know if migration of pit water in the shallow subsurface will eventually discharge to Clancy, Pen Yan Creek, or Spring Creek or to the alluvium of these creeks.

13. The fact that the depth to ground water in the Clancy Creek alluvium is below the stream bottom indicates that Clancy Creek is a losing stream. How will this affect wetlands mitigation proposed on Clancy Creek? Is there any potential for pit lake waters to eventually flow through the Clancy Creek alluvium?

14. What is the basis for the statement that ground water drawdown that results from pit dewatering cannot be measured 0.5 miles from the center of the pit (page 3-76)? Is there a monitoring well located 0.5 miles upgradient of the pit?

15. Tables 3.6.1 and 3.6.2 indicate that numerous ground water monitoring wells are completed across the alluvium-bedrock interface. This is an improper construction. The alluvium and the bedrock should be considered as two separate aquifers. Water levels in wells completed across the interface do not represent true water levels for either aquifer. Solute concentrations obtained from water quality samples from these wells represent a mixture of ground waters, are not representative of alluvial ground water and cannot be used to compare to standards or pit water quality or seepage from the tailings impoundments.

16. What are the potential effects of allowing the ground water levels to recover along the northwest pit highwall after operations stop?

17. How will the higher ground water levels affect the realignment of Clancy Creek?

18. How will the higher ground water levels affect the stability of the hillside above the new Clancy Creek alignment? Is there a contingency in the event that there are unexpected stability problems?

19. How will the MDEQ or MDSL enforce the use of adequate controlled blasting techniques during the construction of the highwall above the new alignment for Clancy Creek?

20. Data on mine pit dewatering clearly demonstrate that ground water flow in the bedrock is controlled by the distribution and orientation of fractures and other geologic structures (page D-4). The predominance of preferential flow paths requires some understanding of the recharge, flow and discharge of ground water in these features. There is no information in the DEIS regarding the nature and extent of these preferential flow paths. If contaminated pit water discharges into the bedrock after pit dewatering is stopped and ground water levels recover, will this contaminated water discharge directly to a nearby stream or to nearby alluvial deposits?

F. Water Quality Monitoring

21. We suggest referencing during the page 2-9 discussion of the water resources operational monitoring program the location of the additional specific information on water resource and water quality monitoring that is provided in DEIS Section 2.3.10 and in Sections 3.6 and 3.7, especially the monitoring locations and summaries of some of the water quality monitoring data. This would assist the DEIS reader in understanding where more specific information on water monitoring stations and data could be reviewed.

22. Spring Creek Surface water monitoring stations SW-3 and SW-3A discussed on page 3-115 do not appear to be included on Figure 3.7-1 (page 3-113) showing surface water monitoring sites. The FEIS should include a Figure showing the location of the Spring Creek monitoring sites in relation to the mine facilities. The FEIS should also clearly identify where Spring Creek surface flows originate below the mine site. We also believe that there should be monitoring sites in the alluvium of Spring Creek located immediately downgradient from the south pond and sedimentation pond that would measure potential effects of groundwater discharge from this mine area on the water quality in the alluvium of Spring Creek. Presently it does not appear that there are any monitoring stations that would allow determination of effects of contaminated mine site water discharge to the Spring Creek alluvium.

    The Pen Yan Creek monitoring stations appear for the most part to be located up-gradient from many mine activities. Are there any monitoring sites on Pen Yan Creek located near its confluence with Spring Creek?

G. Mine Mitigation/Contingencies

23. Thank you for discussing reclamation objectives and topography and reclamation following mining (pages 2-19 to 2-25, 2-42 to 2-50, 2-54 to 2-59). The DEIS states that contingencies to address undesirable results from monitoring would be addressed in bonding, but are not considered part of Alternative 3 (page 2-60). What contingencies are being considered in the event that water quality monitoring evidences environmental degradation such as elevated metals levels in mine site runoff or seepage and/or downstream drainages, or development of poor water quality conditions in the pit lake?

    Are hydraulic conductivity requirements being considered in regard to the proposed cap on the tailings impoundment following mine closure to limit seepage and oxygen flux down through the tailings to minimize tailings leachate and oxidation of tailings (i.e., avoid elevated metals in tailings leachate)? Similarly, are caps with hydraulic conductivity requirements that limit seepage and oxygen flux through the waste rock pile being considered?

    Generation of hard rock mine waste rock metal-bearing ARD is generally believed to be dependent upon the simultaneous availability of (1) appropriate sulfide mineral surface, (2) oxygen, (3) moisture, (4) a temperature above the freezing point of water, and (5) a iron sulfide assimilating bacteria such as Thiobacillus Ferrooxidans that accelerate the conversion of ferrous to ferric iron. The elimination of the presence of any one of these variables significantly retards the ARD reaction.

    It is not clear to us if the best strategy to address ARD at a particular mine site is to retard ARD reactions or accelerate these reactions. Retarding ARD reactions can avoid further waste rock and tailings oxidation, metals mobilization, and may avoid or reduce the need for water treatment. Acceleration of the ARD reactions would be intended to promote a rapid waste rock pile and tailings oxidation, perhaps over a relatively short term, and thus, reduce the potential for long-term ARD development and the long-term, even perpetual, water treatment in the event of contaminated waters. What would be the most environmentally protective and cost-effective mitigation strategy for the Montana Tunnels Mine?

    Given the history of adverse environmental effects that have resulted from some hard rock mines in the past, and the expenditure of public funds that has been used in some cases to address environmental problems caused by mining (such as CERCLA, CECRA, or the State abandoned mine reclamation funding), we believe it is appropriate to more fully identify and describe in the FEIS contingency actions to address potential environmental problems.

    The CEQ NEPA regulations indicate that appropriate mitigation measures not included in the proposed action or alternatives should be included in the environmental impact analysis, and the discussion environmental consequences should include means to mitigate adverse environmental impacts if not fully covered in the presentation of alternatives (40 CFR 1502.14(f)), 40 CFR 1502.16(h)). Mitigation includes the concepts of: (40 CFR 1508.20)

(a) Avoiding the impact altogether by not taking a certain action or parts of an action.
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
(c) Rectifying the impact by repairing, rehabilitating, or restoring the affected environment.
(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
(e) Compensating for the impact by replacing or providing substitute resources or environments.

We believe the FEIS should more fully address contingency actions that may be needed during mine operation and following mine closure to mitigate potential environmental impacts. We recommend that a Contingencies and Corrective Action Plan be prepared in association with operational and post-closure mine reclamation and monitoring plan. A Contingencies and Corrective Action Plan in association with monitoring is needed to describe potential contingency actions that would be carried out if environmental degradation is detected during monitoring (particularly water quality degradation).

The intent is to promote comprehensive early planning regarding actions that can be taken if degradation or toxic or nuisance conditions are detected, so that they may be more readily addressed. By initiating monitoring and pollution controls early, there is less chance of development of significant degradation and toxic or nuisance conditions. Such a plan is particularly helpful for a mining project where there is uncertainty regarding the extent of development of acid mine drainage and/or toxic metals mobilization both during and after mining.

A Monitoring Plan should be conducted throughout operations and for as long as needed in Post Closure with associated Contingencies and Corrective Action Plan modifications as needed. The monitoring plan should identify sampling locations, monitoring parameters, analytical and interpretation methods, and the alert or trigger levels, which when exceeded would trigger more intense follow-up monitoring or investigation, and/or contingency or corrective actions that would correct or avoid worsening of the problem.

This Monitoring Plan and associated Contingencies and Corrective Action Plans should also assist in estimating and tabulating costs of implementation of contingency actions to better assure that funding will be available to mitigate possible detrimental environmental effects. It is important that all foreseeable contingencies be included in establishing post-closure bonding and financial assurance arrangements. Estimated costs of any surface water and ground water treatment resulting from post-closure geochemical interactions should be considered in financial assurance arrangements.

H. Closure

24. **Water Treatment** What are the details regarding potential treatment systems that are being considered for treatment of mine site contaminated waters (a potential need to treat mine site runoff and/or seepage following mine closure is suggested on page 2-52)?

25. **Tailings/Waste Rock:** We believe it is important that mine mitigation measures be planned and designed with the expectation that runoff and/or leachate from waste rock piles and the tailings impoundment has potential to be contaminated with elevated metals levels over the long-term (i.e., decades). Alternative 3 addresses some of these concerns, but not all concerns.

    The DEIS states that is unclear whether current neutral conditions in the tailings would continue as tailings consolidation occurs and tailings dewater, thereby, exposing tailings to higher concentrations of oxygen at closure, and when tailings derived from the higher acid-generating potential ore mined from the deeper portions of the pit are placed in the tailings impoundment (pages 3-46, 3-61). It should not be assumed that the neutral conditions present in the tailings impoundment during operation will continue after dewatering.

    We recommend that the preferred alternative include tailings impoundment mitigation measures to reduce the potential for development of tailings seepage or leachate containing elevated metals levels. These include measures noted on page 3-70 such as addition of lime to the tailings during final operations to enhance the neutralization potential of the final lift of tailings; placement of a thicker, denser impoundment cap that would both reduce oxygen flux to slow down oxidation of the tailings, and reduce hydraulic conductivity and water movement down through the tailings, and thus, reduce seepage of water through the tailings and volume of tailings leachate.

    As noted above, we support adequately encapsulating potentially acid-generating waste rock with neutralizing rock, and using impermeable waste rock caps and pile designs that minimize water movement down through waste rock piles.

26. **Postclosure Monitoring** – We believe the FEIS should further discuss the long-term monitoring program for evaluation of surface and groundwater quality at the Montana Tunnels Mine site, including the adequacy of funding to carry out monitoring over potentially many decades. It is important that water sampling and testing assess metals levels in waste rock piles and tailings runoff and leachate, other mine site runoff/drainage and groundwater, pit lake water quality, and down-gradient stream water quality.

    We support the proposal for conduct of an operational verification program to monitor tailings storage facility leachate quality and pit water quality during operation and for the 5-year closure period to verify estimates of seepage and pit lake water quality made in this EIS, and verify and calibrate models (page 3-106).

We believe the monitoring program will likely need to be conducted well beyond 5 year closure period due to the long-term insidious nature of acid rock drainage and the chemical reactions that mobilize metals (i.e., years or even decades). The conceptual monitoring schedule in Table 2.3-3 (page 2-45) shows that some groundwater monitoring and surface water monitoring stations may be monitored for 15 or even 30 years post-closure. We believe it is essential that water monitoring continue at least that long and likely longer. The long-term monitoring program should be evaluated periodically (at least annually) in consultation and coordination with the MDEQ and BLM, and modified as necessary to assure that monitoring is capable of detecting water quality changes that may occur over time.

It is stated that south pond seepage would recharge groundwater and flow towards Spring Creek following mine closure and cessation of pumping of the tailings seepage recovery well system, and that the pit lake may seep to groundwater in the Spring Creek drainage (pages 3-89, 3-99). We have concerns about the potential for contaminated groundwaters to seep into surface waters both during mining and after mine closure. This could degrade surface water quality resulting in adverse effects to downstream aquatic life.

Are the mine site surface and groundwater monitoring stations appropriately located and considered adequate to monitor and detect all possible pathways of runoff and seepage from the waste rock storage areas, the tailings storage facility, south pond and any other potential sources of water borne pollutants or contaminants? See our comment above (#22) about the need to have a monitoring site in the Spring Creek alluvium immediately downgradient of the south pond area.

We believe the FEIS should further discuss the long-term monitoring program for evaluation of surface and groundwater quality at the Montana Tunnels Mine site, including the adequacy of funding to carry out monitoring over potentially many decades. It is important that water sampling and testing assess metals levels in waste rock piles and tailings runoff and leachate, other mine site runoff/drainage and groundwater, pit lake water quality, and down-gradient stream water quality.

Additional information or discussion regarding the criteria that will be used to decide if it is appropriate to decommission the south pond after the 5 year closure period is needed. Will this decision be based on meeting applicable standards for waste rock and tailings impoundment runoff and seepage collected in the combined drains? How will compliance with Montana ground water quality standards be determined for the tailings facility seepage collected in the combined drains? Where will the point(s) of compliance be located? Will standards have to be met consistently over a period of time? If so what time frame? What measures are included to assure that groundwater with elevated metals levels does not seep to Spring Creek and contribute metals loading to this already impaired stream?

The DEIS indicates that water quality standards have already been exceeded in Clancy Creek, Pen Yan Creek and Spring Creek at times for arsenic, cadmium, copper, lead, manganese and zinc due to historic mining (pages 3-116, 3-119, 3-122). The agencies need to make efforts to avoid any further degradation of water quality, and work toward water quality restoration in the mining area over the long-term.

27. Alternative 3 would provide for long-term maintenance of the south pond liner system, and continuation of pumping south pond water into the pit or treating the water to ensure that any discharge meets groundwater quality standards (page 2-52). The pond liner would not be breached and tailings storage facility seepage would continue to be pumped into the pit or treated as necessary in such cases with Alternative 3 (page 3-106). The south pond liner would only be breached in Alternative 3 if pond water quality met DEQ-7 groundwater standards, and if the operational verification program indicated tailings storage facility seepage was worse than predicted.

    Additionally, with Alternative 3 the recovery well system would continue to be operated beyond the 5 year closure period to prevent contaminant migration in groundwater if necessary. If water quality from the combined drains does not meet groundwater quality standards by the end of the closure period, the south pond and liner system would be maintained and water would be pumped into the pit or treated to ensure the discharge met groundwater quality standards (page 2-52).

    We support use of the additional mitigation measures proposed in Alternative 3 over Alternative 2. We also believe south pond water must meet ground water quality standards before breaching of the south pond liner is considered, and in fact, should meet more stringent surface water quality standards if there is any potential for contaminated pond water to enter surface waters.

    As noted earlier, we are concerned about the possibility of contaminated seepage flows entering surface waters and causing harmful effects, including aquatic toxicity, in downstream surface waters. We believe the FEIS should more fully describe the long-term water handling and management plan (i.e., beyond the 5 year closure period), including the potential need for future treatment of contaminated mine site waters. We are concerned that the potential ecological risks of contaminated ground and surface waters have not been fully addressed, and adequate details on water management and mitigation measures have not been provided.

I. Closure-Pit Lake

28. **Pit Dewatering** --It is stated that water seeping into the pit is pumped to the tailings storage facility (page 2-5), and that these flows have ranged from 25 gpm to 900 gpm, with variability in mine pit inflow due to variability in bedrock fracture and fault conditions and variability in precipitation and groundwater recharge. Has any water quality monitoring been conducted on this pit dewatering flow? The quality of pit

dewatering flows may provide clues to the eventual water quality in a pit lake following mine closure.

29. **Pit Lake Water Quality** – It is proposed after mining that pit dewatering would cease and the pit would be allowed to fill via seepage and precipitation, and with pumping of south pond waters into the pit. As you know, pit highwall rock can generate acid and/or mobilize trace metals (page 3-39), and some mineralized and sulfidic rocks may remain in the pit that could oxidize and release metals, and water with elevated metals levels may leak into the pit along fractures or faults.

    The discussion on page 3-130 indicates that when the mine was permitted in 1986 the pit water was expected to contain elevated levels of iron, manganese, and zinc that could reach several thousand micrograms per liter, and aluminum, cadmium, copper, and lead were expected to be as high as several hundred micrograms per liter. These concentrations are well in excess of the surface water quality standards.

    The DEIS, however, states at the bottom of page 3-130 that while manganese would exceed the SMCL, predicted pit water quality would meet DEQ-7 surface water quality standards. This statement regarding compliance with DEQ-7 surface water quality standards and Tables 3.7-6 and 3.7.-7 showing predicted pit water quality for Alternatives 2 and 3, respectively, appears to be a change from the earlier 1986 predictions regarding pit lake water quality.

    The ore, waste rock and tailings metal mobility kinetic tests show that there is potential for elevated levels of some harmful or toxic constituents such as arsenic, cadmium, copper, lead, manganese and zinc to occur in the pit lake following mine closure. The discussion of future pit lake water quality on pages 3-64 and 3-65 predicts elevated levels of cyanide, cadmium and manganese. The DEIS also states that NP:AP ratios increase with depth in the pit (page 3-43), so that deepening of the pit increases potential for acid generation in the tailings and waste rock (page 4-11). This is likely to increase the potential for elevated metals to occur in the pit lake following mine closure. The revised model, however, appears to predict significantly improved water quality than had been predicted in 1986.

    The mass loading model used to predict pit lake water quality (Montana Tunnels, 2007) is not well referenced. The discussion of the predictions of heavy metals concentrations in the pit water made by this uncalibrated model does not include any indication of the error bars associated with the concentration values or the time frames that exceedances will occur. This is a significant omission. MDEQ and BLM should not accept model predictions as accurate –there are always error bars. In addition the model does not attempt to simulate geochemical processes that effect metal speciation and attenuation.

    Without detailed technical review of modeling results, we cannot refute the model predictions, but we do want to express concerns about the potential for pit lake water quality to be worse than predicted (i.e., have elevated levels of toxic metals). We believe the pit lake water quality predictions and modeling should be reviewed and discussed further in the FEIS, particularly the change from the earlier 1986 predictions of several thousand micrograms per liter iron, manganese, and zinc, and several hundred micrograms per liter aluminum, cadmium, copper, and lead.

We have concerns that water in the pit following mine closure could have harmful or toxic levels of manganese and other metals such as Cd, Cu, Pb and Zn and possibly cyanide and arsenic. We are concerned about potential adverse effects to the public as well as to waterfowl or other wildlife that may attempt to use the pit lake at some point in the future following mine closure. The DEIS also states that at some point it is likely that pit water would seep to the Spring Creek drainage through relatively permeable zones located along the southeast side of the mine pit (page 4-11).

30. **Contingencies for Pit Lake** We do not see adequate contingencies or corrective actions proposed in Alternative 3 to address the possible development of degraded or even toxic conditions in the pit lake following mine closure, and seepage of degraded water to Spring Creek. We believe contingency actions that may be available in the event that pit lake water quality is worse than predicted should be further discussed in the FEIS.

    Has potential injection of alkaline amendments (e.g., limestone, soda ash, caustic soda, hydrated lime) into the pit lake to raise the pH and alkalinity of the pit lake to precipitate metals been considered in the event of development of elevated metals levels in the pit lake?

    Also have partial backfilling and/or re-contouring the pit to improve post-mining access and to provide shallow areas and enhance aquatic habitat, improve wildlife access and aesthetics been considered? Although if the pit may have degraded water quality fencing the pit off from public access rather than enhancing public access may need to be considered.

31. The DEIS states that the pit lake would be used as a resting area for migrating birds, and that bats and birds could use the pit lake as a drinking water source and feed on flying insects attracted by the water, and some birds and bats might use the pit highwalls for nesting or roosting (page 1-14). Are fisheries and aquatic life uses and public recreational uses (boating) of the pit lake anticipated? We note that several mine pit lakes in Nevada now have fish. Post-closure uses of the pit lake and public access to the pit lake should be more clearly disclosed.

32. The DEIS states that the pit water level will reach equilibrium an elevation of 5625 feet or about 15 feet below the elevation of Clancy Creek. However the DEIS provides no information on the error bars or uncertainties inherent in the model predictions. If the error bars exceed 15 feet -then it can be expected that the pit will overflow and some water will discharge to Clancy Creek. Are the permitting agencies accepting the model prediction as 100 % accurate?

In the event that pit water seeps into the ground water along the southeast side of the pit –what actions are proposed to assure that this water will meet all applicable standards? Will there be a compliance well located in the Spring Creek alluvium to monitor inflow of pit water, via ground water transport, into Spring Creek? Will the quality of this water meet surface water standards?

J. Financial Assurance, Bonding

33. NEPA requires that all relevant information concerning environmental impacts be disclosed to the public before decisions are made and before actions are taken (40 CFR 1500.1(b)). 43 CFR 3809 requires BLM to correctly identify and incorporate all applicable reclamation and administrative costs for mitigation measures that will prevent unnecessary and undue degradation of the environment. We are concerned that the current level of bonding may not be adequate to assure that mitigation of acid-generating waste rock is implemented and any surface water degradation that may occur during or after mine closure will be appropriately remedied.

34. The DEIS states (page 1-16) that the MDEQ and BLM jointly hold reclamation bonds in the amount of $18,125,177. The periodic five-year bond review for an inflation increment was done in March 2007 and $18,692,193 has been posted. Adequate bonding is required by both the Metal Mine Reclamation Act (MMRA) and 43 CFR 3809 so this issue is not explored further in the DEIS for any of the action alternatives. However, EPA believes that the bonding issue must be carried into the FEIS to assure the public that the full cost of potential acid rock drainage mitigation measures has been disclosed. Although these measures may be regarded as a contingency plan, compliance with surface and ground water quality standards is required upon closure and into future when latent acid-generating waste may become more apparent from new mined material from the deepened pit

    NEPA requires that all relevant information concerning environmental impacts be disclosed to the public before decisions are made and before actions are taken (40 CFR 1500.1(b)). We are concerned that the current level of bonding may not be adequate to assure that environmental degradation that may occur during or after mine closure will be appropriately remedied.

    Additional discussion of the adequacy of the financial assurances to fund the closure and post-closure periods should provide more detailed information to the public on both the provisions for contingencies as well as the major tasks in the reclamation plan.

    EPA strongly recommends that bonding requirements be appropriate for the amount of uncertainty regarding the predictions for the length of time predicted for the pit to fill, the future water quality in ground water and the pit and the uncertainties associated with the future tailing impoundment chemistry. The adequacy of the financial assurances should be further discussed in the FEIS. We recommend that the reclamation bonds be updated to provide for the long-term operation and maintenance plan that may be needed to address all the uncertainties and to mitigate any future environmental degradation.

35. BLM has the authority under 43 CFR 3809.552(a) to obtain full-cost financial guarantees for long-term water treatment and other obligations that may arise should the impacts from the agency-modified alternative not follow the current hydrogeochemical model predictions and expectations for leachate generation potential from the long-term kinetic leaching tests. The Geochemical Testing Report (Appendix B, Page B-1) suggests that the proposed action could potentially alter [historical] geochemical behavior of ore, waste, and tailings materials if ore mined from the pit expansion has different geochemical qualities than previously mined ore. An elevated potential for acid generation and metal mobility from these materials is cause for concern and the provisions for financial assurance should be discussed in the FEIS.

K. Riparian Habitat and Wetlands Impacts

36. EPA would have objections to the proposal in Alternative 2 to excavate and remove 1,800 feet of the Clancy Creek channel and associated wetlands (page 2-46), without adequate mitigation of impacts to stream and wetland habitat. The Alternative 2 proposal to place the natural stream channel in a pipe and open-flow channel with loss of the streams aquatic habitat would be unacceptable.

    We are pleased that Alternative 3 includes a proposal to correct this deficiency by constructing a replacement channel for Clancy Creek (page 2-54), that will include a 200 foot buffer distance between the M-Pit rim and the constructed channel to provide for natural channel function and development of riparian vegetation, and be fenced to reduce grazing impacts (pages 3-200, 3-201). The channel would be designed to accommodate the 1 in 20 year return period 24 hour storm event. Any flows greater than this storm event would be routed into the pit. The proposed mine expansion would also relocate 3,800 feet of Pen Yan Creek, to make room for additional storage of waste rock (page 3-129).

    We believe it is important that modifications to the Clancy Creek stream channel be planned and designed to simulate natural channel dimensions, patterns, length, sinuosity, profile, and aquatic habitat features (riffle, pool, run). We recommend that aquatic biologists and staff with training and knowledge of fluvial geomorphology and aquatic habitat be consulted during design of Clancy Creek stream channel relocation. Why is the design flow for reconstructed Clancy Creek a 1 in 20 year return period 24 hour storm event (page 2-54)? Most projections of precipitation are for 10yr/24 hr events or 25yr/24 hr events (See Western U.S. Precipitation Frequency Maps NOAA Atlas 2 published in 1973. (HDSC/NWS Office of Hydrology) or *(wrcc@dri.edu)*. The FEIS should also more clearly disclose what would occur during Clancy Creek flood events. Will Clancy Creek flood flows discharge to the pit lake?

37. EPA considers the protection, improvement, and restoration of wetlands to be a high priority, since wetlands have experienced severe cumulative losses nationally. Wetlands increase landscape and species diversity, support many species of western wildlife, and are critical to the protection of designated water uses. Potential impacts on wetlands include: water quality, habitat for aquatic and terrestrial life, flood storage, ground water recharge and discharge, sources of primary production, and recreation and aesthetics. Executive Order 11990 requires that all Federal Agencies protect wetlands. In addition national wetlands policy has established an interim goal of **No Overall Net Loss of the Nation's remaining wetlands**, and a long-term goal of increasing quantity and quality of the Nation's wetlands resource base (see "Presidential Wetland Policy of 1993" at website, http://www.usace.army.mil/inet/functions/cw/cecwo/reg/aug93wet.htm).

    We appreciate the evaluation and discussion of wetlands impacts and wetland mitigation in DEIS Section 3.8, and Appendix A. The DEIS indicates that 2.63 acres of wetlands would be disturbed by mining, and an additional 2.13 acres would be impacted during development of a wetland mitigation project, so that the total amount of wetland impacts would be 4.77 acres (page 3-139). A wetland mitigation site has been identified in the Clancy Creek drainage below the mine site that would result in creation of 5.13 acres of wetlands. This would result in an increase in wetlands of 0.36 acres. The DEIS also states that it also likely that additional wetlands may become naturally established along the relocated Clancy Creek channel with Alternative 3.

    It is important that Montana Tunnels Inc., and BLM and MDEQ consult with the Corps of Engineers in regard to Clean Water Act Section 404 permit requirements for construction activities in or near streams or wetlands, (e.g., contact Mr. Allan Steinle of Corps of Engineers Montana Office in Helena at 406-441-1375). The 404(b)(1) Guidelines (found at 40 CFR Part 230) provide the environmental criteria by which 404 permits are evaluated. See Corps of Engineers Montana Regulatory Office website for further information, https://www.nwo.usace.army.mil/html/od-rmt/mthome.htm .

    It will also be important to obtain other appropriate permits and authorizations from the Montana DEQ and other permitting agencies (e.g., Section 318 short term turbidity exceedance authorization, 310 or 124 permits, MPDES Stormwater permits, etc.). A Storm Water Pollution Prevention Plan (SWPPP) should be prepared with appropriate sediment and erosion control measures such as catch basins, silt fences, coffer dams, and appropriate stormwater treatment systems as prescribed by the MDEQ.

    Section 404 Dredge and Fill Permit rules/policies require that adverse impacts to aquatic resources be avoided and minimized as much as possible, and that unavoidable impacts to wetlands be compensated for. The goal of wetland mitigation should be to replace the functions and values of impacted wetlands in areas adjacent to or as close as possible to the area of wetlands loss. Wetland restoration is preferred to wetland creation or enhancement because restoration has a higher rate of success.

The proposed wetland mitigation along Clancy Creek would create 5.13 acres of wetlands to compensate for loss of 4.77 acres, for a 1.08 acre to 1 acre mitigation ratio. EPA/Corps policy has accepted acre-for-acre replacement of wetlands as a surrogate for replacement of functions and values when there is a lack of definitive information on functions and values, although adjustments may be necessary to reflect the expected degree of success of mitigation, and provide an adequate margin of safety to reflect anticipated success (i.e., greater than acre-for-acre replacement is suggested when impacted wetlands have high function & value and likelihood of replacement of functions is low). Traditional mitigation is often not successful in fully restoring wetland function, and 2:1 or higher mitigation ratios are sometimes required to mitigate wetlands impacts. We are concerned that a 1.08:1 mitigation ratio may not be successful in fully restoring wetland functions. We recommend additional discussion of the likelihood of restoring lost wetland functions and values with a 1.08 to 1 mitigation ratio.

We also understand that modifications of the wetland mitigation plan are being considered that would relocate mitigation wetlands to the Corbin flats area rather than on Clancy Creek. The FEIS should fully describe any modifications to the proposed wetlands mitigation plan, and assure that functions and values of impacted wetlands will be replaced, and that modifications to the wetlands mitigation plan undergo appropriate review and approval by the permitting agencies.

L. Other

38. The DEIS references a K-Pit, L-Pit, and M-Pit in the DEIS, yet the figures show that there is only one open pit on the mine site. A reader can surmise that the different pit names are used to denote various pit expansions over time, however, it may improve public understanding to provide an explanation of the different pit nomenclature used (i.e., K-Pit, L-Pit, M-Pit) at the beginning of the DEIS.

39. Figure 2.2-2 (page 2-6) shows NaCN (sodium cyanide) addition during ore processing, although the text says that a bulk-flotation cyanide leaching circuit was abandoned in 1987. Why is the use of NaCN shown in Figure 2.2-2 if its use in ore processing has been abandoned?